Roll No.

Total No. of Pages : 02

Total No. of Questions : 20

M.Sc. (Physics) (2018 Onwards Batch) (Sem.–1) ELECTRONICS Subject Code : MSPH-414-18 M.Code : 75125

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains SEVEN questions carrying FIVE marks each and students have to attempt any SIX questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

## SECTION-A

- 1. What are the performance characteristics of AID and D/A converters?
- 2. Differentiate semiconductors, conductors and insulators on the basis of band gap.
- 3. In an op-amp Rf = 10 K[] and R1= 1K[] and IIA = 200nA. Determine output offset voltage due to this current.

Define intrinsic standoff ratio of UJT.

- Why SCR cannot be used as a bidirectional switch?
- 5.

4.

- Which flipflop is also known as a transparent latch and why? 6.
- Differentiate photodiode and photo transistor. 7.
- What are the uses of digital frequency meter? 8.
- Define diffusion current and drift current in a semiconductor. 9.
- 10. Write about parallel in-serial out shift register.

## SECTION-B

- 11. How Zener diode can be used as a voltage regulator?
- 12. Design 16:1 multiplexer using 4:1 multiplexers
- 13. What is race around condition in JK flip flop? How it can be overcome?
- 14. Explain the VI characteristics of SCR in detail.
- 15. What is an operational amplifier? Explain its different applications.
- 16. Minimize the following expression using K-map:

Y = A'CD + AB'D' + ABCD + A'B'C'D' + AB'CD'

17. Design a simple BCD-to-seven segment decoder

## SECTION-C

- 18. Design MOD-12 synchronous counter using JK flip flops.
- 19. a) Explain successive Approximation AID converter in detail.
  - b) Explain the working principle of digital voltmeter with a neat block diagram.
- 20. Write short notes on any two :
  - a) DIAC
  - b) LCD
  - c) 555 Timer

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.